Monitoring and Evaluation

An Overview of Strategies and Preliminary Findings for the HSI-STEM Bridges Across Eastern Queens Project

Kate Winter, PhD
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Overview

• Logic Model
• Assessment Strategies
• Data Collection
  • Implementation and outputs
  • Outcomes
• Preliminary Findings
• Wrap up
Logic Model

**Increased Hispanic and low-income students graduating with STEM baccalaureate degrees**
- Improved academic outcomes in landing (+.5 GPA) and gateway (+.5 GPA) courses
- Improved semester to semester retention in STEM (+4%)
- Increased number of STEM majors (+3%), particularly among Hispanic and low-income students (+7%)
- Decreased time to graduation for STEM majors (-1 term)
- Increased rate of 4-year graduation for STEM majors (+2%)
- Decreased “wasted” credits from STEM QCC transfers (- credits), and time to graduation (-2 terms)
- Increased number of placement tests (4)

**Students are exposed to improved courses, peer support/mentoring, and new/updated articulation agreements (for transfers from QCC)**

**Faculty prepared to teach STEM landing courses**

**STEM landing courses redesigned to facilitate learning**

**Instructors/courses using peer mentors and discussion leaders**

**Students prepared to serve as mentors and discussion leaders**

**IMPROVE ACCESS**
Redesign STEM landing courses through structured observations, faculty development, and curricular reform

**IMPROVE LEARNING**
Develop learning collectives (peer-led instruction and mentoring)

**BRIDGE**
Build and sustain cross-campus groups of faculty and administrators dedicated to improving programs, policies, and practices in STEM education

Monitoring and Direction from Leadership Team
Assessment of Implementation and Outputs

• Timing: The activity was implemented within a time frame that allowed most target recipients to access it on time or with only minor delays. The activity was not interrupted and achieved its intended duration.

• Scope: The activity was implemented exclusively to those randomly assigned to receive the treatment and a majority were exposed to the activity.

• Details: The activity was implemented as proposed, or with justified changes.
Assessment of Outcomes

• Procedures meet What Works Clearinghouse group design standards without reservations

• Cluster-level (sections) RCT (randomized controlled trial) experiment

• ITT Protocol (Intention to treat, or “as randomly assigned,” not as treated - condition compliance counts!)

• Scores of prior academic achievement and socioeconomic status are covariates in analysis

• Hierarchical (nested) analysis model to explore impact of treatment on students within sections
Outcomes to Explore

- Academic outcomes in STEM landing courses (final course GPAs)
- Academic outcomes in STEM gateway courses (final course GPAs)
- Semester-to-semester retention in STEM (percent returning the term after treatment)
- Number of STEM majors (number and percent of majors declared)
- Number of Hispanic & low-income STEM majors (number and percent of majors declared)
- Time to graduation for STEM majors (time to degree, in terms/semesters)
- Four-year graduation for STEM majors (percent STEM students graduating within four years)
- “Wasted” credits for STEM transfers from QCC (number of credits accumulated at graduation)
- Time to graduation for STEM transfers from QCC (time to degree, in terms/semesters)
- Number of articulation agreements for QCC-to-QC STEM programs (number of programs with articulation agreements)
- Number of placement tests for STEM developed and placed into use (number of discipline-specific tests)
- Coverage of performance goals, methods, and rubrics for assessing learning and progress developed for STEM programs (percent of programs with assessment measures)
Data Collection: Implementation and Outputs

- Survey (Google Form) of treatment faculty regarding their course redesign activities
- Project coordinators monitor implementation and provide data
- Sheet in gDrive of all randomly assigned treatment and control sections, with details of what form treatment implementation took
- Faculty pre and post surveys regarding summer workshops and faculty development opportunities
- Administrative documents from the project about faculty and student participants (peer mentoring sessions, workshop attendance, etc.)
- Classroom observations
Data Collection: Outcomes

• Official data come directly from Dr. Cheryl Littman; Acting Dean, Office of Institutional Effectiveness (OIE)

• Testing and refining data solicitation and provision processes
  • KWE provides OIE a list of all study courses (txt and cntrl) each term
  • OIE adds all study IDs for all students in study course sections to a table
  • KWE receives back the list of all sections with headcounts by section
  • KWE receives data for all study sections with student study IDs, demographics and baseline covariates, and course GPA
  • KWE receives data for all students in the study table each term for STEM Gateway course GPA, retention, graduation, time to graduation, and credits at graduation (as applicable)
Preliminary Findings: Implementation

• High rate of sections being “out of compliance” with their random assignment (10 of 19 in Chemistry and 4 of 22 in Biology)

• Many “course redesign” treatments being implemented as peer mentors, only

• Learning Collectives appear to have been merged into “course redesigns”

• Implementation data collection needs refinement

• Implementation fidelity needs improvement

• We've all learned a lot to support these improvements!
## Preliminary Findings: Outcomes

- Unofficial data from ONE class of ONE participating department
- Ignores random assignment (data lumped by instructor with 2 instructors each having one section out of compliance)
- Does not use required baseline covariates

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*Effect size is calculated using Hedge's g for continuous variables and Cox's Index for dichotomous variables*
## Comparison of Outcomes by ITT Analysis

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Summary

• Many aspects of implementation are proceeding as proposed
• We need to ensure everyone joining the project understands the RCT structure and the intervention details (i.e., course redesigns)
• We need to ensure everyone complies with the RCT structure
• I need to pin down some data collection details to ensure timely and accurate data, so that I may better monitor efforts and offer timely formative feedback
• I am very excited about the level of involvement and enthusiasm I have perceived from project staff, faculty, peer mentors, and other stakeholders
Questions or Comments?
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703-574-3746